

**APPENDIX L**

**SUPPORTING INFORMATION  
FOR AIR QUALITY**



## AIR QUALITY

This appendix presents an overview of the Clean Air Act (CAA) and the State of Florida air quality program. The appendix also discusses emission factor development and calculations including assumptions employed in the air quality analyses presented in the Air Quality sections of Chapters 3 and 4.

### Air Quality Program Overview

In order to protect public health and welfare, the USEPA has developed numerical concentration-based standards or NAAQS for six “criteria” pollutants (based on health related criteria) under the provisions of the Clean Air Act Amendments of 1970. There are two kinds of NAAQS: Primary and Secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (Government Printing Office, no date).

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the Federal program. The Division of Air Resource Management within the Florida Department of Environmental Protection (FDEP) administers the state’s air pollution control program under authority of the Florida Air and Water Pollution Control Act and the Environmental Protection Act.

Florida has adopted the NAAQS except for sulfur dioxide (SO<sub>2</sub>). USEPA has set the annual and 24-hour standards for SO<sub>2</sub> at 0.03 parts per million (ppm) (80 micrograms per cubic meter [µg/m<sup>3</sup>]) and 0.14 ppm (365 µg/m<sup>3</sup>) respectively. Florida has adopted the more stringent annual and 24-hour standards of 0.02 ppm (60 µg/m<sup>3</sup>) and 0.1 ppm (260 µg/m<sup>3</sup>) respectively. In addition, Florida has adopted the national secondary standard of 0.50 ppm (1300 µg/m<sup>3</sup>). Federal and State of Florida ambient air quality standards are presented in Table L-1 (FAC, 1996).

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the United States as having air quality better than (attainment), worse than (nonattainment) the NAAQS, and unclassifiable. Those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are “unclassifiable” and are treated as attainment until proven otherwise. Attainment areas can be further classified as “maintenance” areas. Maintenance areas are those areas previously classified as nonattainment and have successfully reduced air pollutant concentrations below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. All areas of the state are in compliance with the NAAQS.

**Table L-1. National and State Ambient Air Quality Standards**

Criteria Pollutant	Averaging Time	Federal Primary NAAQS <sup>1,2,3</sup>	Federal Secondary NAAQS <sup>1,2,4</sup>	Florida Standards
Carbon Monoxide (CO)	8-hour 1-hour	9 ppm <sup>5</sup> (10 mg/m <sup>3</sup> ) <sup>6</sup> 35 ppm (40 mg/m <sup>3</sup> )	No standard No standard	9 ppm (10 µg/m <sup>3</sup> ) <sup>7</sup> 35 ppm (40 µg/m <sup>3</sup> )
Lead (Pb)	Quarterly	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	0.053 ppm (100 µg/m <sup>3</sup> )	0.053 ppm (100 µg/m <sup>3</sup> )	0.053 ppm (100 µg/m <sup>3</sup> )
Ozone (O <sub>3</sub> )	1-hour <sup>8</sup> 8-hour <sup>9</sup>	0.12 ppm (235 µg/m <sup>3</sup> ) 0.08 ppm (157 µg/m <sup>3</sup> )	0.12 ppm (235 µg/m <sup>3</sup> ) 0.08 ppm (157 µg/m <sup>3</sup> )	0.12 ppm (235 µg/m <sup>3</sup> ) 0.08 ppm (157 µg/m <sup>3</sup> )
Particulate Matter ≤10 Micrometers (PM <sub>10</sub> )	Annual 24-hour <sup>10</sup>	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>
Particulate Matter ≤2.5 Micrometers (PM <sub>2.5</sub> )	Annual 24-hour <sup>11</sup>	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>
Sulfur Dioxide (SO <sub>2</sub> )	Annual 24-hour 3-hour	0.03 ppm (80 µg/m <sup>3</sup> ) 0.14 ppm (365 µg/m <sup>3</sup> ) No standard	No standard No standard 0.50 ppm (1300 µg/m <sup>3</sup> )	0.02 ppm (60 µg/m <sup>3</sup> ) 0.10 ppm (260 µg/m <sup>3</sup> ) 0.50 ppm (1300 µg/m <sup>3</sup> )

Source: Florida Department of Environmental Protection, 2000.

1. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year.

2. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury; ppm refers to parts per million by volume.

3. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

4. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

5. ppm = parts per million

6. mg/m<sup>3</sup> = milligrams per cubic meter

7. µg/m<sup>3</sup> = micrograms per cubic meter

8. The ozone one-hour standard still applies to areas that were designated nonattainment when the ozone eight-hour standard was adopted in July 1997. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1 averaged over a three-year period.

9. The 8-hour ozone standard is attained when the 3-year average of the annual fourth-highest daily maximum 8-hour average is not greater than 0.08 ppm.

10. The PM<sub>10</sub> 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

11. The PM<sub>2.5</sub> 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

- 1
- 2 Each state is required to develop a state implementation plan (SIP) that sets forth how CAA
- 3 provisions will be imposed within the state. The SIP is the primary means for the
- 4 implementation, maintenance, and enforcement of the measures needed to attain and maintain
- 5 the NAAQS within each state and includes control measures, emissions limitations, and other
- 6 provisions required to attain and maintain the ambient air quality standards. The purpose of the
- 7 SIP is twofold. First, it must provide a control strategy that will result in the attainment and
- 8 maintenance of the NAAQS. Second, it must demonstrate that progress is being made in
- 9 attaining the standards in each nonattainment area.

In attainment areas, major new or modified stationary sources of air emissions on and in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without causing significant adverse deterioration of the clean air in the area. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds: 100 or 250 tons/year based on the source's industrial category. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any regulated pollutant. Table 2 provides a tabular listing of the PSD significant emissions rate (SER) thresholds for selected criteria pollutants (USEPA, 1990).

**Table L-2. Criteria Pollutant Significant Emissions Rate Increases Under PSD Regulations**

Pollutant	Significant Emissions Rate (tons/year)
PM <sub>10</sub>	15
Total Suspended Particulate (TSP)	25
SO <sub>2</sub>	40
NO <sub>x</sub>	40
Ozone (VOC)	40
CO	100

Source: Title 40 CFR Part 50

The goal of the PSD program is to: 1) ensure economic growth while preserving existing air quality, 2) protect public health and welfare from adverse effects which might occur even at pollutant levels better than the NAAQS, and 3) preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas. Sources subject to PSD review are required by the CAA to obtain a permit before commencing construction. The permit process requires an extensive review of all other major sources within a 50-mile radius and all Class I areas within a 62-mile radius of the facility. Emissions from any new or modified source must be controlled using Best Available Control Technology. The air quality, in combination with other PSD sources in the area, must not exceed the maximum allowable incremental increase identified in Table L-3. National parks and wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development. The areas surrounding Eglin Air Force Base and Hurlburt Field are classified as Class II. Currently there are no designated Class III areas in the United States.

**Table L-3. Federal Allowable Pollutant Concentration Increases Under PSD Regulations**

Pollutant	Averaging Time	Maximum Allowable Concentration (µg/m <sup>3</sup> )		
		Class I	Class II	Class III
PM <sub>10</sub>	Annual	4	17	34
	24-hour	8	30	60
SO <sub>2</sub>	Annual	2	20	40
	24-hour	5	91	182
	3-hour	25	512	700
NO <sub>2</sub>	Annual	2.5	25	50

Source: Title 40 CFR Part 50

µg/m<sup>3</sup> = Micrograms per cubic meter

Florida has a statewide air quality-monitoring network that is operated by both state and local environmental programs (FDEP, 2003). The air quality is monitored for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. The monitors tend to be concentrated in areas with the largest population densities. Not all pollutants are monitored in all areas. The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards, also included are areas where the ambient standards are being met but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The end-result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality, exceedances of air quality standards, and pollutant trends.

The FDEP Northwest District operates monitors in several counties, including Bay, Escambia, Holmes, Leon, Santa Rosa, and Wakulla counties. Over the years of record there have been exceedances (pollutant concentration greater than the numerical standard) of a NAAQS. However, there has not been a violation (occurrence of more exceedances of the standard than is allowed within a specified time period) of an ambient standard (FDEP, 2003).

## Project Air Emission Calculations

### *Demolition Emissions*

Demolition calculations for this EIS were completed using guidance from *GAP Filling PM<sub>10</sub> Emission Factors for Selected Open Dust Sources* (USEPA, 1988). Demolition of structures involves two primary sources of emissions: destruction of the building and site removal of debris. Emissions calculations from mechanical dismemberment, debris loading, and on-site truck traffic to remove debris have been individually developed.

Dismemberment of a structure can be estimated using the AP-42 equation for batch drop operations:

$$E_D = k (.0032) * ((U/5)^{1.3} / (M/2)^{1.4}) \text{ lb/ton}$$

Where:  $k = .35$  for PM<sub>10</sub>

$U$  = mean wind speed (default = 5 mph)

$M$  = material moisture content (Default = 2%)

And  $E_D = .0011$  lbs/ton (with default parameters)

This factor can be modified for waste tonnage related to structural floor space. The following relationships were determined from a 1976 analysis by Murphy and Chatterjee (1976) of the demolition of 12 commercial brick, concrete and steel buildings:

Where: 1 ft<sup>2</sup> floor space = 10 ft<sup>3</sup> original building volume  
1 ft<sup>3</sup> building volume = .25 ft<sup>3</sup> waste volume  
1 yard<sup>3</sup> building waste = .5 ton weight  
Mean truck capacity = 30 yard<sup>3</sup> haulage volume

From these data, 1 ft<sup>2</sup> of floor space represents .046 tons of waste material, and a revised emission factor related to structural floor space can be obtained:

$$E_D = .0011 \text{ lbs/ton} * .046 \text{ ton/ft}^2 = .000051 \text{ lbs/ft}^2$$

The proposed emission factor for debris loading is based on two tests of the of filling of trucks with crushed limestone using front end loader, part of the test basis for the batch drop equation in AP-42, 11.2.3. Crushed limestone was considered closest in composition to the broken brick and plaster found in demolished commercial buildings. The measured emission factors for crushed limestone were .053 and .063 lbs/TSP. To convert the average TSP factor, .058 lbs/ton, to a PM<sub>10</sub> factor with source extent of structural floor space the previously determined estimate of .046 ton/ ft<sup>2</sup> and particle size multiplier must be used. The result is the emission factor for debris loading:

$$E_L = k(.058) \text{ lb/ton} * .046 \text{ ton/ ft}^2 \\ = .00093 \text{ lbs/ ft}^2$$

where k is .35 is derived from the recommended particle size multipliers developed by Muleski (1987).

The emissions factor used for on-site truck traffic is based on the unpaved road equation:

$$E = k (5.9) * (s/12)(S/30)(W/30)^{.7} * (w/4)^{.5} * (365-P/365) \text{ lb/VMT}$$

Where k= .36 for PM<sub>10</sub>

s = silt content (default = 12%)

S = truck speed (default = 10 mph)

W = truck weight (default = 22 tons)

w = truck wheels (default = 10 wheels)

p = number of days with precipitation (default = 0 days)

For a demolition site, 10-wheel trucks of mean 22-ton gross weight are estimated to travel a quarter mile on-site for each round trip to remove dry debris. With this information and default values for the unpaved road equation, the emission factor for on-site truck traffic becomes:

$$E_T = (.36) (5.9) * (12/12)(10/30)(22/30)^{.7} * (10/4)^{.5} * (365-0/365) \text{ lb/VMT} = 4.5 \text{ lb/VMT}$$

To convert this emissions factor from lb/VMT to lb/ ft<sup>2</sup> of structural floor space, it is necessary to use the previously described relationships obtained from Murphy and Chatterjee (1976).

$$.25\text{mi}/30\text{ yd}^3\text{ waste} * \text{yd}^3 / 4\text{ yd}^3\text{ volume} * 10\text{ yd}^3\text{ volume}/\text{yd}^2\text{ floor space} * \text{yd}^2 / 9\text{ ft}^2$$

$$= .0023\text{ mi}/\text{ft}^2$$

$$\text{and } E_T = 4.5\text{ lb/VMT} * .0023\text{ mi}/\text{ft}^2 = .01\text{ lb}/\text{ft}^2$$

Combining each of the aforementioned factors for building demolition, debris loading, and truck traffic provides a recommend factor of:

$$E_{10} = E_D + E_L + E_T:$$

$$= .000051 + .00093 + .01\text{ lb}/\text{ft}^2$$

$$= .011\text{ lb}/\text{ft}^2$$

This value was then multiplied by the gross square footage to be demolished to ascertain the  $PM_{10}$  emissions for the demolition activities.

### ***Construction Emissions***

Construction emissions calculations were completed using the calculation methodologies described in the U.S. Air Force Air Conformity Applicability Model (ACAM). As previously indicated, a conformity determination is not required since Okaloosa County is designated “attainment,” the ACAM was used to provide a level of consistency with respect to emissions factors and calculations.

The ACAM evaluates the individual emissions from different sources associated with the construction phases. These sources include grading activities, asphalt paving, construction worker trips, stationary equipment (e.g. saws and generators), architectural coatings, and mobile equipment emissions (U.S. Air Force, 2003)

### ***Grading Activities***

Grading activities are divided into grading equipment emissions and grading operation emissions. Grading equipment calculations are combusive emissions from equipment engines and are ascertained in the following manner:

$$\text{VOC} = .22\text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

$$\text{NO}_x = 2.07\text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

$$\text{PM}_{10} = .17\text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

$$\text{CO} = .55\text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

$$\text{SO}_2 = .21\text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

Where Acres = number of gross acres to be graded during Phase I construction.

DPY<sub>1</sub> = number of days per year during Phase I construction which are used for grading

2000 = conversion factor from pounds to tons

All emissions are represented as tons per year.



Grading operations are calculated using a similar equation from the Sacramento Air Quality Management District and the South Coast Air Quality Management Districts (Sacramento Metropolitan Air Quality Management District, 1994). These calculations include grading and truck hauling emissions.

$$PM_{10} \text{ (tons/yr)} = 60.7 \text{ (lbs/acre/day)} * \text{Acres} * DPY_1 / 2000$$

Where Acres = number of gross acres to be graded during Phase I construction.

DPY<sub>1</sub> = number of days per year during Phase I construction which are used for grading

2000 = conversion factor from pounds to tons

Calculations used in the EIS assumed that there were no controls used to reduce fugitive emissions. Also, it was assumed that construction activities would occur within 182 days and grading activities would represent 10 percent of that total. Therefore, 18 days was the duration established for grading operations. Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management (Sacramento Metropolitan Air Quality Management District, 1994).

### ***Architectural Coatings***

Architectural coating emissions are released through the evaporation of solvents that are contained in paints, varnishes, primers, and other surface coatings.

$$VOC_{SF} \text{ (lbs/yr)} = 65.6 \text{ (lbs/unit)} * \text{Number of Single Family Units}$$

Where: Number of Single Family Units = total number of single-family units to be constructed in the given year of construction.

2000 = conversion factor from pounds to tons

It was assumed that construction activities would occur within 182 days. After subtracting the grading activities from the estimated overall construction time, the actual construction period was reduced to 164 days. Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management District (Sacramento Metropolitan Air Quality Management District, 1994).

### ***Asphalt Paving***

VOC emissions are released during asphalt paving and are calculated using the following methodology:

$$VOC_{PT} \text{ (tons/yr)} = (2.62 \text{ lbs/acre}) * \text{Acres Paved} / 2000$$

Acres Paved = total number of acres to be paved at the site.

2000 = conversion factor from pounds to tons

The area of asphalt paving was developed by averaging the miles of roads per acre in military family housing areas on Eglin Air Force Base. Geographical Information Systems (GIS)

coverage of the current Old Plew/New Plew Housing Area was selected and road mileage as well as acreage for the area were determined. The miles of road within the Old Plew/New Plew Housing Area (4.76 miles) was divided by the acres in the area (224 acres) to ascertain an average miles of roads per acre (0.019 miles of road/acre). To calculate the area of impervious road surface, this average (0.019 miles of road/acre) was multiplied by the minimum required width of roads in the alternative developments (24 feet) by the acreage of each expansion area, which varied. Since some areas (i.e., wetlands) will not be developed within certain areas, this method of estimation will inherently overestimate road coverage, but it should only be a minimal amount. Using this method .019 miles equals 100.3 feet and multiplying by the required width of roads, a value of 2,407 ft<sup>2</sup> can be established. Multiplying 2,407 ft<sup>2</sup> by the number of houses per acre being developed provides a square footage of road area that can be converted to acres of asphalt (SAIC, 2004). Developing an acreage component using this value would only account for the area where the residential structures are constructed. Therefore, acreage of asphalt was doubled to ensure a conservative emissions calculation estimate was provided. The specific emissions factors used in the calculations were available through Sacramento Air Quality Management and the South Coast Air Quality Management Districts (Sacramento Metropolitan Air Quality Management District, 1994).

### ***Construction Worker Trips***

Construction worker trips during the construction phases of the project are calculated and represent a function of the number of residential units to be constructed and/or square feet of non-residential construction.

Trips (trips/day) = .72 (trip/unit/day) \* Number of Single Family Units

Total daily trips are the applied to the following factors depending on the corresponding years.

Year 2005 through 2009:

$VOC_E = .016 * \text{Trips}$

$NO_{x_E} = .015 * \text{Trips}$

$PM_{10_E} = .0022 * \text{Trips}$

$CO_E = .262 * \text{Trips}$

Year 2010 and beyond:

$VOC_E = .012 * \text{Trips}$

$NO_{x_E} = .013 * \text{Trips}$

$PM_{10_E} = .0022 * \text{Trips}$

$CO_E = .262 * \text{Trips}$

To convert from pounds per day to tons per year:

$$\text{VOC (tons/yr)} = \text{VOC}_E * \text{DPY}_{II}/2000$$

$$\text{NO}_x \text{ (tons/yr)} = \text{NO}_{xE} * \text{DPY}_{II}/2000$$

$$\text{PM}_{10} \text{ (tons/yr)} = \text{PM}_{10E} * \text{DPY}_{II}/2000$$

$$\text{CO (tons/yr)} = \text{CO}_E * \text{DPY}_{II}/2000$$

Where: Number of Single Family Units = total number of single-family units to be constructed in the given year of construction.

2000 = conversion factor from pounds to tons

DPY<sub>II</sub> = number of days per year during Phase II construction activities.

Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management District (Sacramento Metropolitan Air Quality Management District, 1994).

### ***Stationary Equipment***

Emissions from stationary equipment occur when gasoline powered equipment (e.g. saws, generators, etc.) is used at the construction site.

$$\text{VOC} = .198 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

$$\text{NO}_x = .137 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

$$\text{PM}_{10} = .004 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

$$\text{CO} = 5.29 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

$$\text{SO}_2 = .007 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

Where RES = number of residential units to be constructed during Phase II construction.

GRSQF = Gross square feet of non-residential units to be constructed during phase II

DPY<sub>II</sub> = number of days per year during Phase II construction

2000 = conversion factor from pounds to tons

Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management District (Sacramento Metropolitan Air Quality Management District, 1994).

### **Mobile Equipment**

Mobile equipment emissions include pollutant releases associated with forklifts, dump trucks, etc. used during Phase II construction.

$$\text{VOC} = .17 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

$$\text{NO}_x = 1.86 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

$$\text{PM}_{10} = .15 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

$$\text{CO} = .78 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

$$\text{SO}_2 = .23 * (\text{RES} + \text{GRSQFT}) * \text{DPY}_{II} / 2000$$

Where RES = number of residential units to be constructed during Phase II construction.

GRSQF = Gross square feet of non-residential units to be constructed during Phase II

DPY<sub>II</sub> = number of days per year during Phase II construction

2000 = conversion factor from pounds to tons

Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management District (Sacramento Metropolitan Air Quality Management District, 1994).

Land clearing emissions are generated as a result of combustion activities, which occur while burning residual wood and plant debris that was cleared from the construction site.

Emissions are calculated using factors developed by USEPA and the following equation:

$$\text{Emissions} = (\text{Acres} * \text{LF} * \text{EF}) / 2000$$

Where:

Emissions = Pollutant (lbs)

Acres = total acres disturbed

LF = weighted loading factor to convert acres to tons of available fuel

EF = Emission Factor lbs of pollutant per ton of fuel burned

CF = 2000 conversion Factor (lbs to tons)

This method assumes that all land cleared is burned. To more accurately reflect the actual emissions a percentage of the land cleared should be determined and used in the calculation. A fuel loading values reflective of softwood species would be used for calculation purposes and equate to 57 tons of fuel per acre. Emissions factors would include 17 pounds per ton of fuel for PM<sub>10</sub>, 134 pounds per ton of fuel for CO, and 15.2 pounds per ton of fuel for Non-Methane Hydrocarbons.

### National Emissions Inventory

The National Emissions Inventory (NEI) is operated under USEPA's Emission Factor and Inventory Group, which prepares the national database of air emissions information with input from numerous State and local air agencies, from tribes, as well as from industry. The database contains information on stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants (HAPs). The database includes estimates of annual emissions, by source, of air pollutants in each area of the country, on an annual basis. The NEI includes emission estimates for all 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands. Emission estimates for individual point or major sources (facilities), as well as county level estimates for area, mobile and other sources, are available currently for years 1996 and 1999 for criteria pollutants, and HAPs.

Criteria air pollutants are those for which USEPA has set health-based standards. Four of the six criteria pollutants are included in the NEI database:

- Carbon Monoxide (CO)
- Nitrogen Oxides (NO<sub>x</sub>)
- Sulfur Dioxide (SO<sub>2</sub>)
- Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)

The NEI also includes emissions of Volatile Organic Compounds (VOCs), which are ozone precursors, emitted from motor vehicle fuel distribution and chemical manufacturing, as well as other solvent uses. VOCs react with nitrogen oxides in the atmosphere to form ozone. The NEI database defines three classes of criteria air pollutant sources:

- Point sources - stationary sources of emissions, such as an electric power plant, that can be identified by name and location. A "major" source emits a threshold amount (or more) of at least one criteria pollutant, and must be inventoried and reported. Many states also inventory and report stationary sources that emit amounts below the thresholds for each pollutant.
- Area sources - small point sources such as a home or office building, or a diffuse stationary source, such as wildfires or agricultural tilling. These sources do not individually produce sufficient emissions to qualify as point sources. Dry cleaners are one example, i.e., a single dry cleaner within an inventory area typically will not qualify as a point source, but collectively the emissions from all of the dry cleaning facilities in the inventory area may be significant and therefore must be included in the inventory.
- Mobile sources - any kind of vehicle or equipment with a gasoline or diesel engine; airplane; or ship.

The main sources of criteria pollutant emissions data for the NEI are:

- For electric generating units - USEPA's Emission Tracking System / Continuous Emissions Monitoring Data (ETS/CEM) and Department of Energy fuel use data.
- For other large stationary sources - state data and older inventories where state data was not submitted.
- For on-road mobile sources - the Federal Highway Administration's (FHWA's) estimate of vehicle miles traveled and emission factors from USEPA's MOBILE Model.
- For non-road mobile sources - USEPA's NONROAD Model.
- For stationary area sources - state data, USEPA-developed estimates for some sources, and older inventories where state or USEPA data was not submitted.

State and local environmental agencies supply most of the point source data. USEPA's Clean Air Market program supplies emissions data for electric power plants.

## References:

- Code of Federal Regulations, Florida Administrative Code (FAC) 62-204.240 (1)(a-b), 1996. Ambient Air Quality Standards; Florida Department of Environmental Protection, March.
- Code of Federal Regulations, Code of Federal Regulations, Title 40, Part 50 (40 CFR 50), <http://www.access.gpo.gov/nara/cfr/cfr-retrieve.html>.
- Florida Administrative Code (FAC) 62-204.360 (4)(b), 1996a. Prevention of Significant Deterioration Areas; Florida Department of Environmental Protection, March.
- Florida Department of Environmental Protection (FDEP), 2003. Electronic mail communication with Mr. Kevin White, NWD Air Permitting Supervisor; Subject: Attainment status of Okaloosa county, February.
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